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RELATIONSHIP BETWEEN PREVENTION OF WASTE AND *ZERO WASTE* MOVEMENT

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Annotation. Climate change, the population of the earth, consumption, decrease of natural resources are the factors that force the search for the most effective environmental solutions. Waste prevention and management policies focus on finding solutions that deliver real results in reducing resource use and avoiding environmental pollution by waste. EU waste prevention and management policy is based on a ranking of priorities: prevention; preparing for re-use; recycling; other recovery, e.g. energy recovery; and disposal. The article aims to reveal the content of waste prevention and its main features. The analysis of legal regulation and national waste prevention policy showed the state's priority tasks in the field of waste prevention. The article briefly discusses the Zero Waste movement, which has been known in some countries for more than a decade and has recently becoming increasingly popular in Lithuania. The article raises the question of whether waste prevention and Zero Waste are the same. Have national regulations and waste prevention and management policies not been stuck in the framework of long-term strategies and are friendly to new ideas? The article concludes that the Zero waste movement in Lithuania can be considered a social phenomenon for the time being, which has no legal basis to consider it as an official part of waste prevention. Despite the lack of state attention to the Zero Waste movement, its objectives clearly coincide with those of waste prevention.

Keywords: environmental law, waste managment, prevention of waste, Zero waste.

INTRODUCTION

Household, construction, food production, electronics and other solid waste management is a universal issue affecting all people in the world. Individuals and governments make important decisions about consumption and waste management that affects their health, productivity, and cleanliness of communities everyday. Poorly managed waste is contaminating oceans, clogging drains and causing flooding, also have a health concerning effects, such as transmitting diseases via breeding of vectors, increasing respiratory problems through airborne particles from burning of waste, harming animals that consume waste without knowing it, and affecting economic development such as through diminished tourism. Unmanaged or

improperly managed waste from many years of economic growth requires urgent action in all levels of society.[1]

Article 3 of Directive 2008/98 / EC defines waste as any substance or object which the holder discards or intends or is required to discard. At all levels, waste is associated with the loss of resources (materials, energy) and waste management inevitably affects the environment (e.g. landfills cover large areas of land, landfills pollutes air, water and soil, and incineration emits air pollutants). The long-term goal of the policy is to reduce the amount of waste generated and, where it is unavoidable, to encourage the use of waste as a resource and to increase its recycling and safe disposal. It is safest to avoid waste as much as possible for the environment and human health, so it is understandable that states want to promote waste prevention measures. Prevention measures can be routine, provided for in long-term documents forming state waste prevention policies. However, the global Zero waste movement shows that alternatives are being sought. The questions are, is waste prevention and Zero waste the same phenomenon? Is the Zero Waste Movement just one of the waste prevention measures? Is it a viable social movement involving individuals, businesses and even states? Does the national legal regulation establishing waste prevention and waste management create preconditions for the expansion of the Zero waste movement in Lithuania?

A.Pasvenskienė and B.Pranevičienė[2] studied the problems of waste prevention, other authors only occasionally discussed the aspects of waste prevention. The movement of zero waste in the context of local waste prevention at the national level is not disclosed by legal scholars; foreign scholars discuss the phenomenon of Zero waste in various aspects of social life: Laura R. Crossley[3], Lili Liu, Yangyang Liang[4] et al., Natasa Petrovic, Dragoslav Slovic,

[1] Silpa Kaza, Lisa Yao and ect., „What a Waste 2.0. A Global Snapshot of Solid Waste Management to 2050“. *International Bank for Reconstruction and Development* / The World Bank, Washington, DC 20433, (2018):295. www.worldbank.org

[2] Aušrinė Pasvenskienė, Birutė Pranevičienė. „Atliekų prevencijos teisinis reglamentavimas“. *Visuomenės saugumas ir viešoji tvarka (8) : mokslinių straipsnių rinkinys = Public security and public order : scientific articles* (8). Kaunas : MRU VSF. ISSN 2029-1701. 2012, [t.] 8, p. 156-168. https://repository.mruni.eu/bitstream/handle/007/15595/Pasvenskien%C4%97.pdf?sequence=1&isAllowed=y

[3] Laura R. Crossley, „Overcoming Challenges to Zero Waste in Massachusetts: Analysis and Recommendations“ (Dissertation). ProQuest LLC (2013). USA:128

[4] Lili Liu,· Yangyang Liang, · Qingbin Song, · Jinhui Li, „A review of waste prevention through 3R under the concept of circular economy in China“. *J Mater Cycles Waste Manag* (2017) 19:1314–1323.

Marko Cirovic[5], S. Lehmann[6], Elizabeth Allison et al[7]. However, it should be emphasized that the issue of the relationship between waste prevention and Zero waste is not given enough attention by scientists. These circumstances determine the relevance of the topic and presuppose the need for a more detailed study of the relevant aspects of legal regulation and practical problems.

The aim of the research is to reveal the peculiarities of waste prevention and Zero waste concepts in order to determine their relationship. To achieve this goal, the article discusses the content and features of waste prevention and reveals the concept of Zero Waste at the national level. **The object of the research** is the legal regulation establishing waste prevention and the peculiarities of the development of Zero Waste as an environmental solution to prevent waste.

Research methods: legal acts regulating waste prevention were researched by the method of document analysis; the peculiarities of the legal substantiation of the Zero Waste movement are assessed by the analytical-critical method; the method of analysis of the scientific literature is used to evaluate the findings of research related to the significance of Zero waste.

CONTENTS OF WASTE PREVENTION

The World Summit on Sustainable Development (Johannesburg Declaration on Sustainable Development) sets out the goal of "Preventing and minimizing waste and maximizing reuse, recycling and use of environmentally friendly alternative materials, with the participation of government authorities and all stakeholders, in order to minimize adverse effects on the environment and improve resource efficiency, with financial, technical and other assistance for developing countries" (Art. 22)[8]. National legislation aims to establish measures to protect the environment and human health and to prevent or at least reduce the harmful effects of the generation and management of waste, as well as to create legal preconditions for reducing the overall impact of resource use and increasing its efficiency. All EU waste prevention and management policies are based on a prioritization of priorities, i.e. the legal framework

[5] Petrovic N., Slovic D., Cirovic M. A., „ZERO WASTE approach in launching a new product: case study". *Metalurgia International;* Bucharest Vol. 18, Iss. 1, (2013): 145-149.
[6] Lehmann, S. „Optimizing Urban Material Flows and Waste Streams in Urban Development through Principles of Zero Waste and Sustainable Consumption"**.** ***Sustainability*****; Basel** Vol. 3, Iss. 1, (2011): 155-183.
[7] E. Allison, „The Reincarnation of Waste: A Case Study of Spiritual Ecology Activism for Household Solid Waste Management: The Samdrup Jongkhar Initiative of Rural Bhutan"**.** *Religions*; Basel Vol. 10, Iss. 9, (Sep 2019).
[8] „Plan of Implementation of the World Summit on Sustainable Development", (2002). [2020- 05-20] . http://www.un-documents.net/jburgpln.htm

establishes the following waste hierarchy: prevention; preparing for re-use; recycling; other recovery, e.g. energy recovery; and disposal[9].

Prevention is understood as measures taken before a substance or product has become waste and which reduce the amount of waste, including through the re-use of products or the extension of the life cycle of products; reduces the negative impact of the generated waste on the environment and human health or the amount of harmful substances in materials and products. Waste prevention is a key objective of waste management policy[10].

In Lithuania, waste prevention policy is reflected in the State Waste Prevention Program[11]. The program is divided into two types of waste prevention measures: (a) waste prevention measures in industrial and commercial establishments which have an impact on the design, manufacture and distribution of products; (b) waste prevention measures that may affect the consumption and use phase of the products.

The first group of measures include the following: (a) integrated pollution prevention and control, which are key measures to promote the introduction of cleaner technologies and which should help to ensure that the best available techniques are used to achieve a high level of environmental protection; (b) plans for the conservation of natural resources and the reduction of waste (those responsible for obtaining environmental permits are required to draw up and implement a joint environmental action plan, including measures to reduce waste); (c) promotion of cleaner production and waste prevention projects (e.g. soft loans); (d) ecodesign of products (life cycle analysis of product development and systematic application of environmental protection requirements during product development); (e) restrictions on harmful substances (e.g. in packaging, electronic equipment, vehicles, batteries, accumulators); (f) environmental management systems (an indirect but effective means of promoting waste prevention, as the establishment of systems would require businesses to look for ways to implement waste prevention measures or to ensure that waste management is prioritized); (g)

[9] *Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. https://eur-lex.europa.eu/legal-content/LT/TXT/?uri=CELEX%3A32008L0098*, 4 straipnis. Article 3 of the Law on Waste Management of the Republic of Lithuania provides an analogous order of priorities applied in the national field of waste prevention and management: prevention; preparation for re-use after separation of products or their components unfit for re-use; recycling after separation of waste unsuitable for recycling; other uses, such as energy recovery from waste, not suitable for recycling or other uses; disposal after separation of suitable waste for recycling or other recovery. https://e-seimas.lrs.lt/portal /legalAct/lt/TAD/TAIS.59267/asr

[10] Directive 2008/98/EC, *supra note 10*

[11] „Valstybinė atliekų prevencijos programa, Lietuvos Respublikos aplinkos ministro 2013 m. spalio 22 d. įsakymas Nr. D1-782“, LRS, https://eseimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.458655/asr

other measures, such as: event "Lithuanian Product of the Year" (great significance for waste prevention).

Another group of waste prevention measures consists of: (a) environmental labeling; (b) the organization of green public procurement; (c) public information and education on waste prevention; (d) social initiatives (indirect waste prevention: e. g. searching for suitable reusable items through social networks); (e) a system of securities for reusable beverage packaging; (f) other measures (e.g. car repair sector, second-hand furniture or clothing stores).

In Lithuania, waste prevention measures cover all waste streams, but priority is given to reducing the generation of packaging, waste electrical and electronic equipment, biodegradable waste, hazardous and construction waste[12].

The Law on Packaging and Packaging Waste Management[13] establishes the priority role of packaging waste prevention, it sets out the main requirements for the production, composition and restrictions of harmful substances. The prevention of packaging waste is defined in the said law as the reduction of the amount and harmfulness to the environment of packaging materials and packaging waste, packaging and packaging waste generated during the production, sale, other distribution, use or disposal of packaged or prepacked products, primarily to develop environmentally friendly products and technologies. In order to reduce the generation of packaging waste, the Program stipulates that measures for the prevention of packaging must be applied in the stages of product design and production (eg eco-design), and the principle of producer responsibility must be implemented. It is important that the retail sector, which uses a large number of group and transport packaging, as well as associations of beverage producers, seek to develop re-use systems and that consumers be informed about the availability of less packaging, reusable, recyclable and economical (larger capacity) packages. Plastic shopping bags are an obvious problem in the context of waste prevention (considering their extremely short-term use; high resource requirements for their production, etc.). The proposed measure to reduce plastic waste is to raise public awareness of the environmental impact of lightweight plastic shopping bags and to change the current perception that plastic is a harmless and cheap material.

[12] State Waste Prevention Program, *supra note* 13
[13] „Lietuvos Respublikos pakuočių ir pakuočių atliekų tvarkymo įstatymas“. LRS, 2020-05-10, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.150891/asr

The safe collection and recycling of hazardous waste electrical and electronic equipment is an important part of quantitative waste prevention. The purpose of prevention of this type of waste is to promote its reuse, to create preconditions for the use of this equipment for as long as possible. The legal framework establishes the application of the principle of producer responsibility, which should promote ecodesign and waste prevention at all stages of the product life cycle. This would ensure the longevity, recyclability of these products and the ability to repair a defective product.

The prevention of biodegradable waste is most likely to be achieved through the reduction of food waste, e.g. The measure provided for in the Action Plan for the Implementation of the State Waste Prevention Program for 2014–2020[14] is to organize a public information campaign aimed at informing the population about the environmental and economic significance of food waste and providing practical advice on reducing food waste (2.4.1.1). Also, in order to reduce the generation of paper waste, it is necessary to reduce the amount of excessive advertising (flyers, leaflets, etc.), to use writing paper more efficiently in offices, to promote the use of electronic information sources and electronic books. Measures for ecological design and implementation of environmental management systems are applied for the prevention of hazardous waste, as well as for the purchase of eco-labeled products by developing the most efficient systems for separate collection of household hazardous waste, educating and informing the public about the use of less hazardous and environmentally friendly household chemicals. Implementation of environmental management systems in construction companies, establishment of construction and demolition waste reuse and exchange centers in municipalities, renovation of buildings, promotion of the use of environmental classification systems for new buildings are measures considered by the state as priorities in the field of construction waste prevention.

The State Waste Prevention Program[15] sets out two objectives of the Waste Prevention Program for 2014–2020. The first objective is to slow down the growth of waste in the manufacturing, construction and other economic sectors as industry and the economy grow, and to keep the amount of waste generated below the EU Member States' average. To achieve this goal, the state plans to promote waste prevention in the production and other economic activities sectors; increase the efficiency of materials and resources; to improve the qualification of

[14] State Waste Prevention Program, *supra note* 13
[15] *supra note* 13

employees of enterprises, farmers, agricultural companies and control institutions in the field of waste prevention. The second objective is to increase the growth of municipal waste, including packaging, electrical and electronic equipment and biodegradable waste, as consumption increases, and to keep the amount of municipal waste generated below the average of the Member States of the European Union. To this end, it is necessary to improve waste management legislation by setting requirements for the prevention and re-use of waste generated by the municipal waste stream; to promote sustainable consumption; to promote the re-use of products and the preparation for re-use; to increase public awareness and improve the qualification of municipal employees in the field of waste prevention.

Thus, the objectives of waste prevention are to avoid the generation of waste; to reduce the amount of generated and unused waste; to reduce the amount of harmful substances in materials and products; reuse products or extend their life cycle. As A. Pasvenskienė and B. Pranevičienė[16] noted, a legal mechanism is being developed for the implementation of waste prevention in the European Union, but the expected result cannot be achieved by creating a legal regulation mechanism alone. It is necessary to combine legal and other measures: efforts to improve the production process of the product, to create products with a longer life cycle, to encourage the population to purchase and use ecological, environmentally friendly and longer-lasting products. As the authors of the code, the experience of the European Union member states shows that economic benefits, dissemination and adaptation of good practices, consumer habits and other social changes have a significant impact on waste reduction.

The analysis of state waste prevention measures and priorities has shown that in Lithuania waste prevention is understood as a system of certain measures that must be applied before a product (another solid object) becomes unnecessary and unusable. Such measures include organizational, technological, educational and information measures.

ZERO WASTE IN THE CONTEXT OF WASTE PRIORITIES

„The world we have created today as a result of our thinking thus far has problems which cannot be solved by thinking the way we thought when we created them“, Albert Einstein.

Global, regional and national environmental policies are based on long-term goals set out in a multi-level strategy. The National Environmental Strategy states that it has been prepared

[16] *Supra note 4*

in order to set priority environmental policy areas, long-term goals until 2030 and Lithuania's environmental vision until 2050. It sets horizontal long-term environmental goals to help politicians, government and business, the social partners and the public choose a more precise course of action. The goal of the environmental protection policy enshrined in the strategy is to achieve that the Lithuanian environment is healthy, clean and safe, harmoniously meeting the needs of society, the environment and the economy. The promotion of waste prevention is understood in this Strategy as a set of measures focusing on the prevention of the generation of waste from production and other economic activities, especially hazardous waste (integrated product policy; promotion of cleaner production and low-waste technologies; and the promotion of recyclable products, the promotion of voluntary environmental audits, the implementation of environmental management systems, the application of life-cycle thinking to product production, the application of preventive measures to reduce municipal waste) in order to prevent or at least increase waste much slower than production. Without denying the importance of these envisaged environmental goals, however, it should be acknowledged that life is currently very dynamic (globalization, development of new technologies, changes in the forms of communication between members of society), so those measures that were effective 20 years ago years may vary significantly. And it is not the measures imposed by governments that are gaining in importance, but the initiatives stemming from the social space. One of them is Zero Waste.

The Planning Group of the Zero Waste International Alliance adopted the internationally accepted definition of Zero Waste (2004): „Zero waste: the conservation of all resources by means of responsible production, consumtion, reuse, and recovery of products, packaging, and materials without burning and wich no discharges to land, water, or air that threaten the environment or human health“[17]. Zero waste activists say they seek to encourage people to change their lifestyles, use durable items, give up toxic substances, not throw away items, and return them for new uses. The idea of zero waste can be described simply - pour coffee into a durable cup that you bring at the gas station, instead of taking a disposable, bring coffee in your natural fiber bag that you bring from home (and at the same time buy it in the store where it is possible), do not throw the thicket into a waste container, and compost together with other food waste and fertilize the plants. The goal of zero waste is to strive for the lowest use of resources,

[17] http://zwia.org/zero-waste-definition/

to give up the exchange of things to the maximum (the fashion industry encourages the opposite), to buy only extremely high quality (usually much more expensive) items. The idea of zero waste is one of the directions of business development, because in Lithuania, as in many countries of the world, food, clothing and cosmetics stores reorganize their trade skills according to these principles[18].

Some researchers argue that "The Zero Waste approach suggests that the entire concept of waste should be eliminated. Instead, waste should be thought of as a "residual product" or simply a "potential resource" to counter our basic acceptance of waste as a normal course of events. Unlike our current system of managing waste, Zero Waste seeks to eliminate waste wherever possible by encouraging a system approach that avoids the creation of waste in the first place. The Zero Waste system approach turns material outputs from one process into resources for other processes"[19]. A similar conclusion is drawn by Ceclan Rodica Elena, Ceclan Mihai, Popa Ionel[20], Shen Xin et al[21]. Conducted a study on the feasibility of creating a waste-free city in Sanya, Hainan Province, and concluded that "A non-waste city is an advanced urban management concept. Its establishment requires redefining the value of waste, reshaping urban recources and waste flow system, and building a green industrial chain. The whole society must participate in the pilot construction of a non-waste city. Citizens are the producers of waste, and have the responsibility to share waste disposal with society, enterprises, and goverments. Resources are limited, and the cycle is infinite. Only by combining green ideas, policies, technologies and business models can a non-waste city be truly achieved".

In many states, Zero Waste is enshrined in state legal documents, e.g. The Massachusetts 2010-2020 Solid Waste Master Plan[22]. "Pathway to Zero Waste identified zero waste as a statewide goal with both environmental and economic development benefits. Zero waste is a

[18]E.g. VEGGO declares that it tries and encourages as little pollution as possible, therefore uses only recycled paper, sends parcels only in used cardboard boxes, sorts waste, donates expired products to local homeless organizations, https://www.veggo.lt/lt/ content / 4-about-us; Urban Earth Lovers sells reusable goods and claims to be guided by responsible consumption, zero waste and low impact, https://www.urbanearthlovers. com/pages/about-urban-earth-lovers; "Zeroteka" http://minimaliai.lt/zero-waste-apsipirkimas-zerotekoje/ (online stores are chosen at random), etc.

[19] *Supra note*, 7

[20] Ceclan, Rodica Elena, Ceclan, Mihai, Popa, Ionel, „Sustainable Waste Management in Europe". *Electrotehnica, Electronica, Automatica: EEA; Bucharest Vol. 59, Iss. 4, (Oct-Dec 2011): 53-59.*

[21] Shen, Xin; Chen, Bowei; Du, Huanzheng, „Current Situation and Strategies of "Non-waste City" Construction in Sanya City, Hainan Province*". Meteorological and Environmental Research*; Cranston Vol. 11, Iss. 2, (Apr 2020): 53-55,61.

[22] „Massachusetts 2010-2020 solid waste master plan: Pathway to zero waste". Massachusetts Department of Environmental Protection. Boston: Executive Office of Energy and Environmental Affairs http://www.mass.gov/eea/agencies/massdep/recycle/reports/solid-wastemaster-plan.html

newer vision formulated in the last two decades that proposes re-organizing linear waste management of extraction: production, consumption, disposal into circular economic cycles of resourc, resource. In part, zero waste helps to reduce greenhouse gas emissions and toxic pollution from the current system[23]. "The author emphasizes, among other things, that one of the most important aspects of achieving zero waste is increasing consumer influence." Partly, this requires changes in consumer understanding of materials management and changes in consumption patterns. When there are alternatives to demand, consumers have the power to influence product development"[24].

"A zero waste approach is one of the fastest, cheapest, and now effective strategies to protect the climate"[25].

The state usually has two ways to introduce a particular environmental measure: to encourage (e.g. exempt from taxes) or to penalize non-compliance with the measure. Of course, there is no legal responsibility in Lithuania for non-compliance with Zero Waste ideas. But are there real incentives? For example, a local fee for the collection and management of municipal waste has been introduced in City X, and a decision by the Municipal Council of City X for the collection and treatment of municipal waste from municipal waste holders has a mandatory fee valid in the applies the Zero Waste method (almost does not generate waste) must pay in accordance with local regulations. Thus, households are not encouraged to apply Zero Waste.

CONCLUSIONS

Waste prevention is at the top of the EU waste hierarchy. In Lithuania, waste prevention is understood as a system of certain organizational, technological, educational and information measures that must be applied before a product (another solid object) becomes unnecessary and unusable. Waste prevention is also often understood as a tool for preparing waste for re-use. Natural persons and businesses (manufacturers, importers, etc.) are encouraged to take waste prevention measures by various means.

Waste prevention measures are often set out in long-term strategic plans for waste prevention and management, but over time such measures may become ineffective or even

[23] *Supra note* 5
[24] *Ibit*
[25] Platt B., Ciplet D., Bailey K.M., Lombardi E., „Stop trashing the climate". *Institute for Local Self-Reliance,* June, 2008. 1-92.

inappropriate. In modern dynamic life, more effective tools are offered by society itself. One of them is Zero Waste.

Waste prevention measures are proposed by governments and Zero Waste by potential waste producers.

In Lithuania, Zero Waste acts as an initiative, not as a state-recognized waste avoidance measure enshrined in legal regulation.

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